A TRIO OF FRENC

1. The elusive

PART 1 of 3

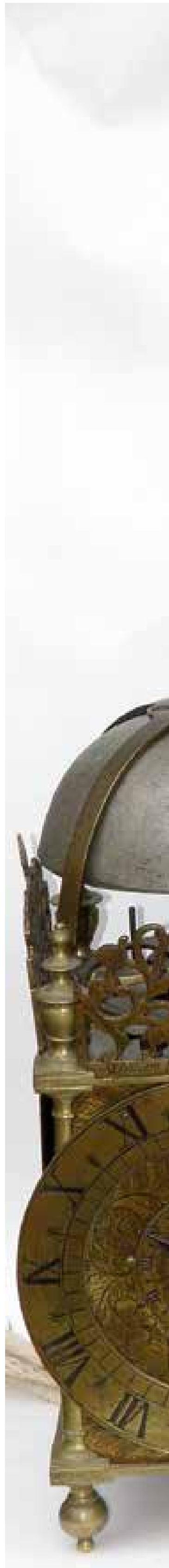
In this three-part series I want to introduce readers to a type of clock that is not normally associated with French horology and which has been largely ignored in the literature: rural posted-frame 30-hour clocks made completely of iron and with painted iron dials.

Mention French clocks and usually the ubiquitous *pendule de Paris* round movements in an ormolu, porcelain or black marble case spring to mind. Or a carriage clock or perhaps a Comtoise clock or even a fine regulator in an elaborate case veneered with kingwood and other exotic timbers. French clockmakers also produced lantern clocks, some of them following English styles, while others are distinctly different, with iron-framed lantern clocks being a speciality of regions such as Normandy where they were often housed in very tall cases. These Normandy movements and dials survive in appreciable numbers, but their impractically tall cases will not fit into modern homes and they have often ended up on a bonfire.

Some Normandy lantern clocks have fairly standard movements, but others have very interesting technical and constructional features. A very small number are known with a centre-sweep seconds hand and another has a month duration—to date the latter is unique, but no doubt others will surface one day. However, the usual Normandy clocks have brass wheels and brass or ceramic dials and were made from the early eighteenth century into the nineteenth century, while the three clocks discussed here are made completely of iron and are much earlier.

The first clock, shown in **figure 1**, has already been the subject of an article in *Antiquarian Holorogy* in March 2012, but further research has helped explain its most obvious eccentricity and its origins are now likely to be a thousand kilometres from where it was once thought to have been made. Frustratingly it is one of the few Continental iron clocks that bears a name, but it is one that has not proved possible to trace (so far). This name

Figure 1. Large iron clock 23in (584mm) tall.



CH IRON CLOCKS

e 'I Prowent'

by John Robey, UK

Figure 2. The iron clock dwarfs a standard-sized London lantern clock of the 1640s by William Selwood.

has turned out to be a red herring in determining the clock's origin and an alternative suggestion is presented here.

It is what might be called a large chamber clock, being 23in (585mm) tall, with a very heavy bell 6in (152mm) diameter and weighing 4.8 pounds (2.2kg). It towers over a normal-size English lantern clock, **figure 2**, and might have been made as early as the 1580s to sit high on the wall of a manor house or a large farmhouse.

As is to be expected with a clock of this age it has undergone several modifications over its long life and the hand is a recent restoration. The painted dial is of an early type, being tall with the chapter ring not extending beyond the rectangle of the iron sheet. The blackground is covered with rather naïve scrolls painted in an off-white or cream colour, while the centre has radiating arrow heads pointing to the hour numerals and shorter half-hour lines. The Roman hours are painted on an off-white chapter ring bordered on both inside and outside by a red band. What is immediately obvious is that these numerals go round the wrong way but, as we will see later, this can now be explained by changes to the escapement and the motionwork. There are no frets, side doors, rear cover, hanging hoop or spikes, with no sign of them having ever been fitted.

The massive posted-frame movement, **figures 3-6**, has forged top and bottom frames that form square open 'plates', which are held on to the baluster-shaped corner pillars with square nuts, **figure 7**. There are no separate feet, the clock standing on short extensions of the screwed lower ends of the pillars. The extensions at the top are longer with smaller diameter screwed ends on to which the iron bell stand is held with square nuts. The bell is held by a square nut screwed on to the bottom of a forged ball-topped finial. The movement bars are held between the top and bottom frames with two lugs and a wedge, in the typical manner used by English and French posted-frame clocks. The central bar is fixed

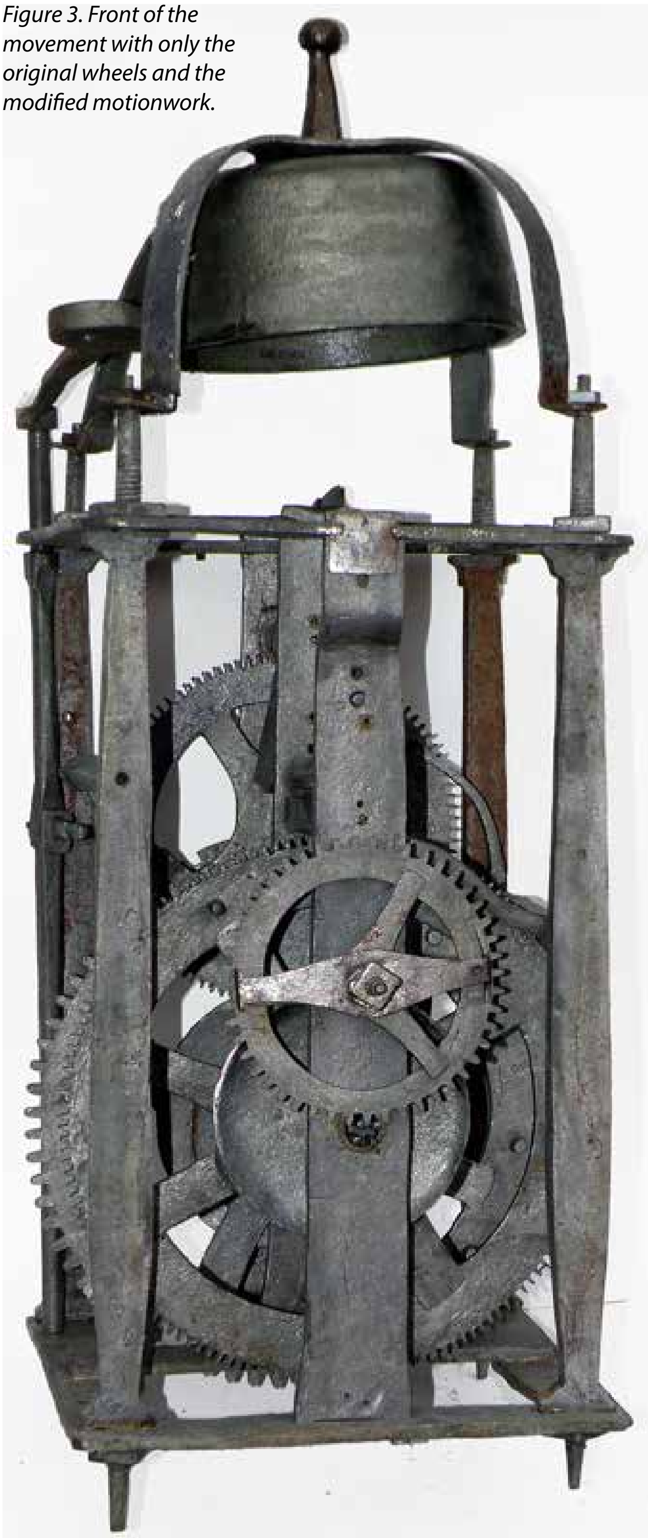


Figure 3. Front of the movement with only the original wheels and the modified motionwork.

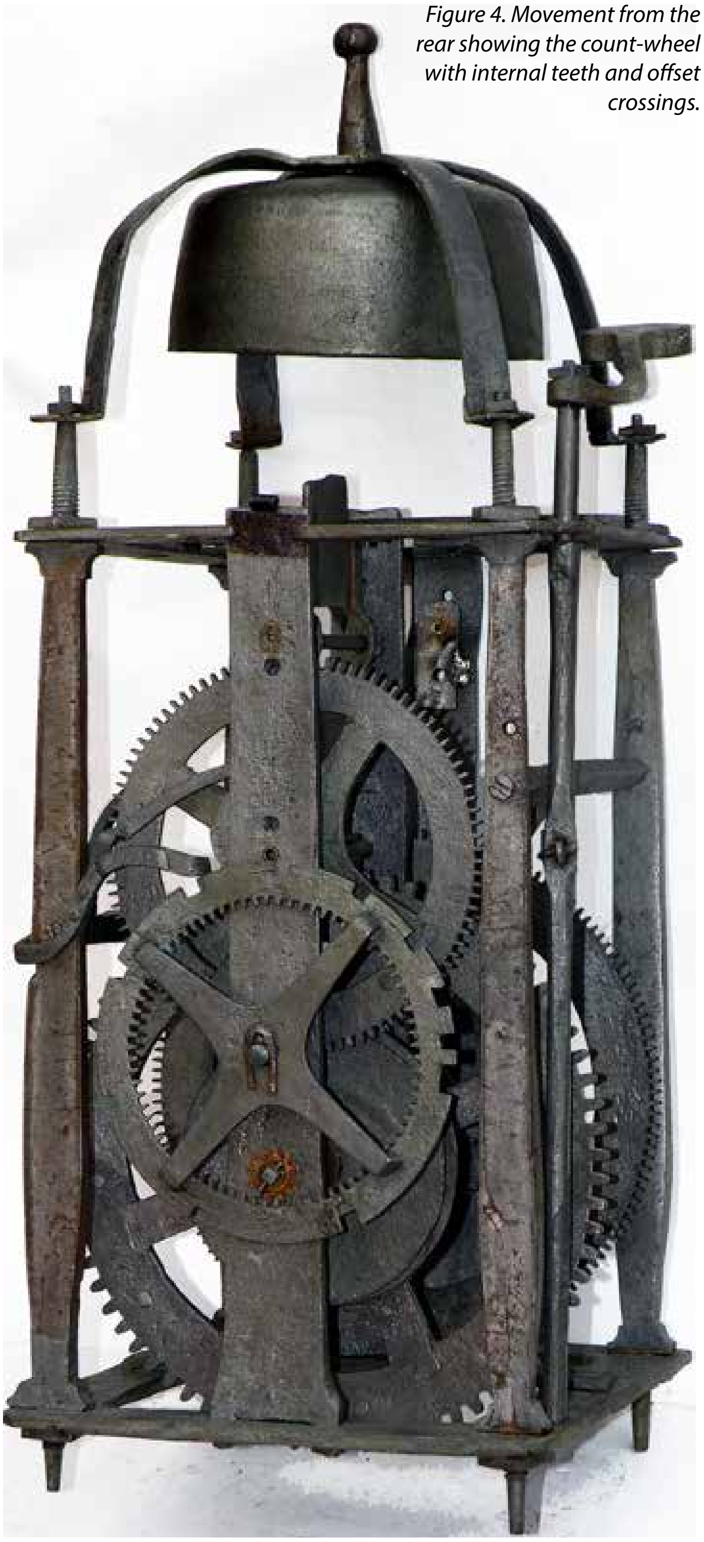


Figure 4. Movement from the rear showing the count-wheel with internal teeth and offset crossings.

in a similar manner to cross members riveted to the plates.

At present there are three wheels in the going train, but originally there would have been only two: the great wheel and a crownwheel with a balance escapement. Many early clocks have gear trains with just two wheels and this is only possible by using very large wheels and a large number of teeth in each one, the going great wheel being 8.6in (217mm) diameter and having 150 teeth, much larger that normally found on a lantern clock. The striking great wheel is even larger at 8.9in (227mm) diameter, but has only 72 teeth.

Some time in the later seventeenth century or early in the following one the balance was replaced by a verge escapement and a short pendulum. This involved replacing the crownwheel with a contrate wheel and adding a new escape wheel above the top plate. Both the original bridge on the central movement bar and the later bottom support for the new crownwheel just above it, can be seen in **figure 5**. When an English lantern clock was converted to pendulum control the original crownwheel was sometimes pressed into service for the new escapement, but this would have not been possible here as the original one might have had 35 teeth or even more. The well-known Nicholas Vallin musical clock in the British Museum, made about the same period as this one, also with only two wheels in the going train, has a crownwheel of 59 teeth. The balances of these early clocks rotate very slowly, the Vallin clock having a beat of two seconds, while others have a beat as

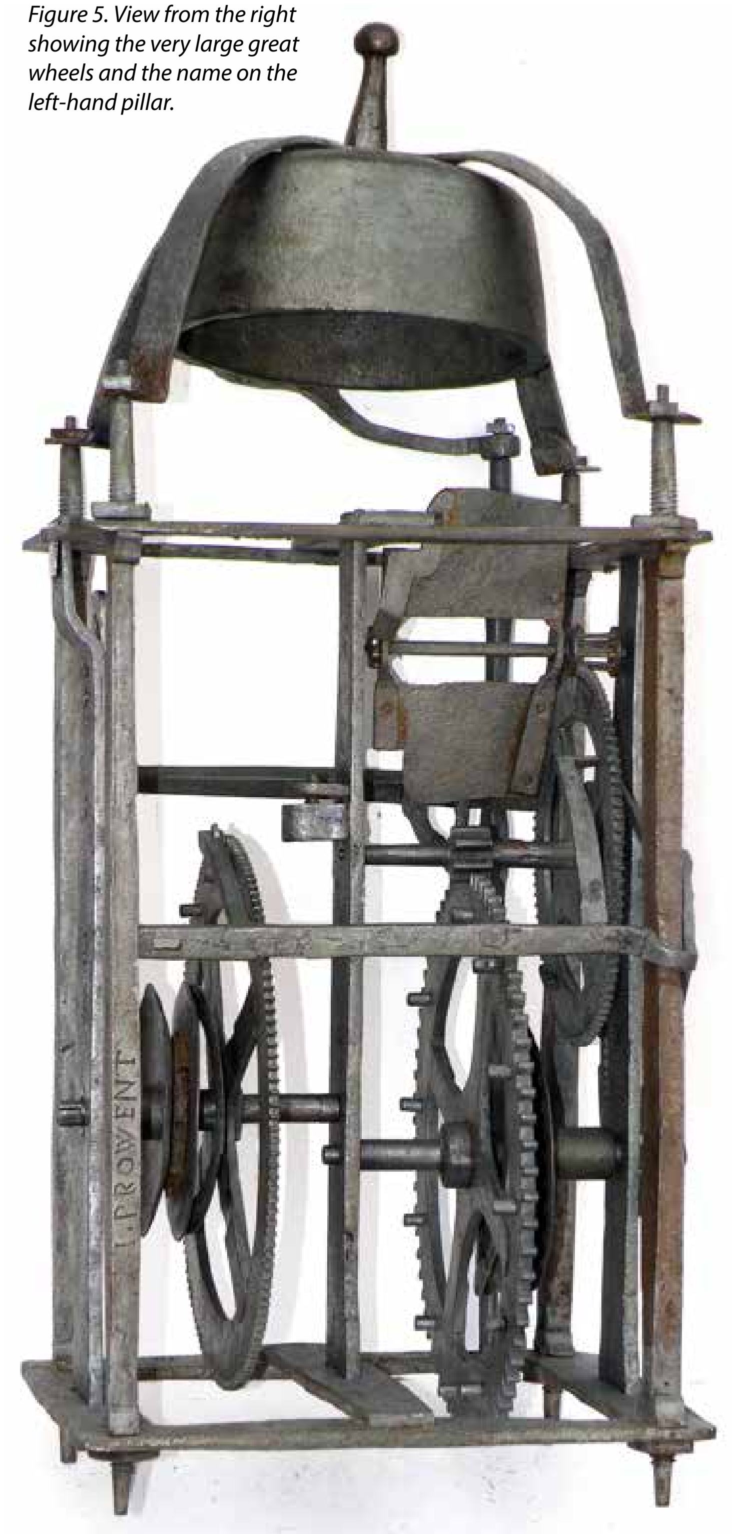


Figure 5. View from the right showing the very large great wheels and the name on the left-hand pillar.

Figure 6. Movement from the left showing the vertical hammer shaft.

slow as three seconds.

Later still—probably some time in the nineteenth century—the verge pendulum was replaced by the present tic-tac escapement, **figure 8**. Now, the escape wheel was below the top plate and the fly and other parts of the striking train prevented the pallet arbor from extending to the rear of the movement with a pendulum swinging outside the rear of the frame. To avoid having to virtually rebuild the clock, the new pendulum consisted of two wires straddling the arbors. Though there are now no bobs, it is likely that there would have been a small one sliding on each wire. Not only would these allow the clock to be regulated, but by adjusting one relative to the other a simple method of setting the clock in beat could be provided.

By comparison the striking train is almost unaltered, **figure 9**. Updating the going train to take advantage of the latest developments in timekeeping technology was a regular occurrence, but there was little need to 'improve' the striking system. The striking train, like the going train, has only two wheels, with both the great wheel and the second wheel, together with its pinion, being original. Fly pinions rotate rapidly and are subject to a great deal of wear, so it is not surprising that on this clock the worn original has been replaced by a lantern pinion. The fly with a small ratchet wheel and click (as often used on turret clocks) instead of a friction spring to allow overrun when the train stops suddenly, is also original. An overlift cam has been added, but this is discussed later.

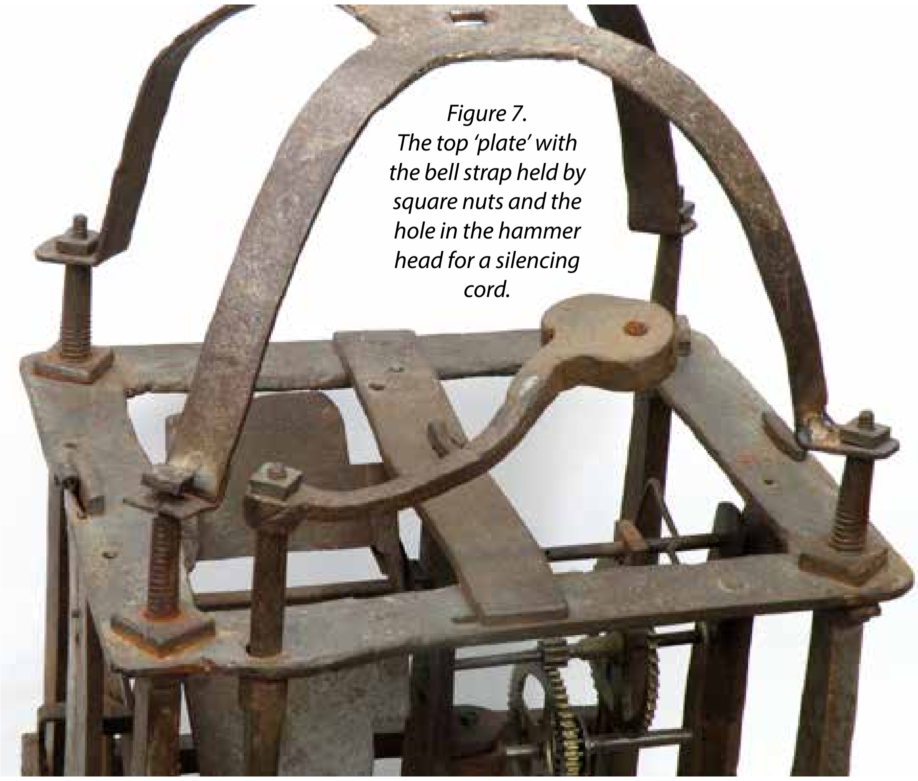


Figure 7. The top 'plate' with the bell strap held by square nuts and the hole in the hammer head for a silencing cord.

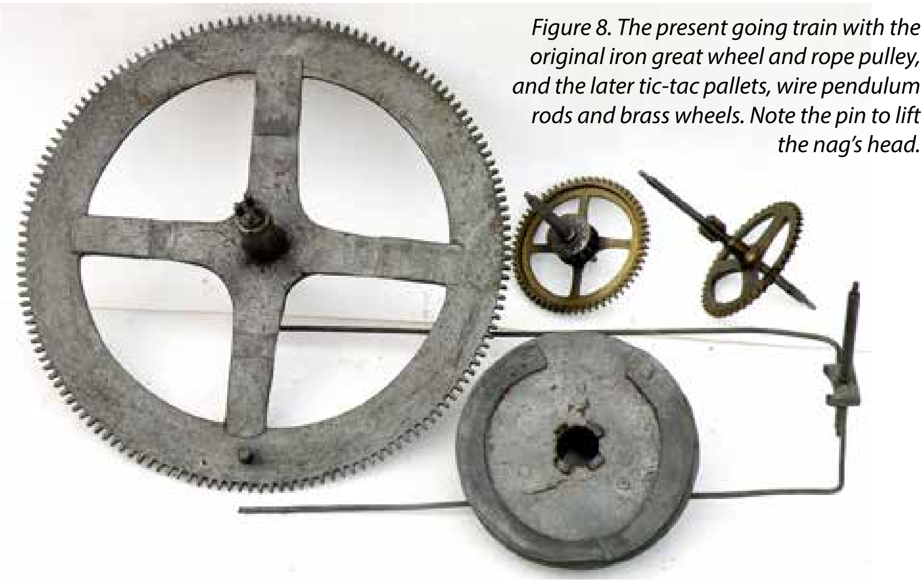


Figure 8. The present going train with the original iron great wheel and rope pulley, and the later tic-tac pallets, wire pendulum rods and brass wheels. Note the pin to lift the nag's head.

Figure 9. The original two wheels and fly of the striking train with a later fly pinion and overlift cam.

The rope pulleys on both great wheels have the 'English' type of strong circular clickspring that acts on the crossings. This is a crude and brutal system that can cause considerable wear to the crossings. A small pivoted click engaging with teeth cut round the inner shroud of the pulley, as used on Germanic clocks, is a much more satisfactory method.

If a component is made perfectly it is often difficult to determine how it was constructed, while a broken, damaged or faulty part is usually much more instructive. On this clock a faulty crossing reveals how the wheels were made. It might be thought that the crossings were attached to the rims by dovetail joints, but **figures 10** and **11** show that the rims have four V-sections filed into the inner edge and V-slots cut in the ends of the crossings. Once the two parts had been fitted together the joints were forged to make a rigid wheel. Despite looking crude they rotate without wobble and are a tribute to the smithing skills of the clockmaker. Punch marks on the rims and crossings indicate the correct positions for ease of assembly. The tips of the teeth have punched dots, showing that they had been marked out using a dividing plate, as was the practice at the time, and not slit with a wheel-cutting engine, which had still to be invented, and in any event was really only suitable for cutting brass wheels.

Striking uses the single-arbor nag's head system and a vertical swivelling hammer, **figures 12** and **13**. The nag's head itself is lifted by a pin on the going great wheel and is heavy enough not to need a return spring, as is usually found on smaller clocks. There have been some modifications and originally overlift would have been by means of a detent on the arbor being lifted by the hammer pins, evidence for its original position being visible. This is the earliest method of providing overlift, but it is not particularly satisfactory. More positive action is obtained by a hoop wheel or a heart cam on the second wheel, so the original detent was removed, and an extension riveted to the count-wheel detent. This overlift detent is now lifted by an eccentric disc added to the second arbor. There are signs that there had been an arm for tripping the strike to synchronise the number of blows to the hour indicated by the hand, but for some unaccountable reason this has been removed.

The heavy hammer head has a hole in the centre (seen clearly in **figure 7**), which does not appear to be a fault in the iron. It may have been a very simple method of silencing the strike at night, with a cord through the hole that could prevent the hammer from hitting the bell when pulled to the side. When the clock was first made, the method used to set the hand to indicate the correct time was to lift the balance and disengage the pallets so that the train ran freely (holding on to the weight to prevent damage) until the hand reached the correct position. Gothic clocks often have a little lever at the side of the movement to do this, or even through the dial. The remains of a rivet on the left-hand side of the top plate indicates where such a lever was fitted, but it was removed when the method of adjusting the hand was altered. A rectangular hole in the bottom plate directly beneath would have been for a long wire return spring, similar to that for the hammer.

This brings us neatly to the problem of the anti-clockwise hour numerals, which are related to the strike let-off and the motionwork. When the article in *Antiquarian Horology* was published it was not known for certain that the chapter ring had been altered, though this seemed highly likely. Paint analysis showed that there was a pigment that suddenly went out of use about 1650, indicating an early date. It also revealed that there were three different schemes: the original and two over-paints, but this could not reveal the earlier designs or the original Roman numerals. It was decided that only removing the top layers of paint over the II would settle the issue. This revealed that originally XI was underneath, **figure 14**, so the numerals and the hand rotated in the conventional clockwise direction.

However, the rope pulley and winding click show that the going great wheel also rotated clockwise with no signs that they had ever been altered. But, when a pinion drives a wheel that has conventional teeth on the outer edge, the wheel and pinion rotate in opposite directions. Hence readers can appreciate why drastic action was needed to uncover further evidence. The only way the hand could have rotated clockwise is for the original hour wheel to have had internal teeth. With internal teeth both the wheel and the pinion rotate in the same direction. This type of wheel was usually used for the count-wheels of early iron clocks and **figure 15** shows that this was the type used here. But after searching through both English and Continental literature, no examples of an hour wheel with internal teeth have been discovered. In this respect this clock, as originally made, was unique.

Conventional crossings prevent

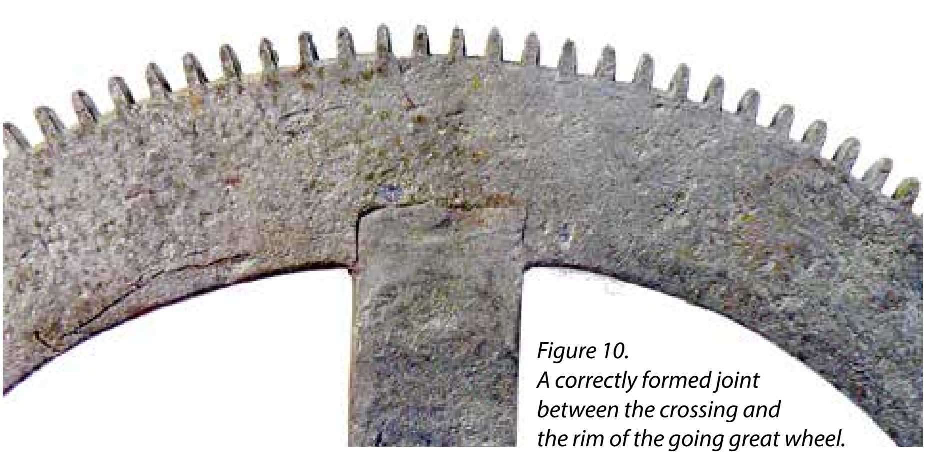


Figure 10. A correctly formed joint between the crossing and the rim of the going great wheel.

Figure 11. End of broken crossing showing how the joint was formed.

Figure 12. Hammer (front), hammer tail (rear right) and strikework arbor (rear left).

Figure 13. Detail of the nag's head.

Figure 14. The original XI revealed beneath the later anti-lockwise hour numerals.

Figure 17. The name 'I. Prowent' engraved on the front right-hand pillar.

Figure 15. Iron count-wheel with internal teeth and offset crossings.

the engagement of the pinion leaves with internal teeth, so the crossings have to be offset and the forged-over ends riveted to the face of the wheel rim. This causes no problem for a count-wheel of this construction, and it would have been quite satisfactory for a dial wheel until the escapement was updated. When the balance was replaced by a verge pendulum it was not so easy to disengage the pallets from the escape wheel to reset the hand. This would have been quite possible by having long pivots so the verge could slide horizontally, with a swivelling end stop to prevent unintentional disengagement. Indeed, this was a popular method with some turret clocks with an anchor escapement during the eighteenth century.

Another method is to swing the verge pendulum up towards the horizontal until the pallets are free of the escape wheel teeth. Why something similar to either of these methods was not done here is difficult to understand, as it resulted in many problems and extra work, all of which could so easily have been avoided. It indicates that whoever did the conversion was not very experienced or at least had never seen a sliding arbor on a turret clock.

With a fixed hand and no means of disengaging the pallets, the only means of setting to time is by stopping the clock and restarting when the hand shows the correct time—very inconvenient. The simplest method would have been to fit the hand on a short pipe which was a friction fit on the pipe of the hour wheel, and this would not have interfered with the internal teeth and offset crossings. Instead the motionwork, **figure 16**, was altered and rather than being fixed directly to the arbor of the hour wheel the hand was fitted to a friction spring that bears on the hour wheel. But this introduces yet another problem: the offset crossings get in the way. The solution was to replace the hour wheel with internal teeth and offset crossings with a conventional wheel with flat crossings and external teeth, **figure 16**. This new wheel, like the originals, is made of wrought iron with separate crossings and rim (though not joined in the same way) and indicates that these changes took place at an early date, probably in the late seventeenth century when the clock was already about a century old.

This introduced a further problem: the hand now rotates backwards and so the chapter ring had to be repainted with anti-clockwise numbers. Not only this, but the strike now occurs at a time that bears no relationship with that shown by the hand. The two can be synchronised, but it involves a procedure that was likely to confuse the average owner. This shows how lack of foresight resulted in problems that compounded themselves, but at least the reason for the anti-clockwise hour numerals can now be explained logically.

This clock came with some interesting provenance, which is always a good start when researching an object's origins. It had been in the collection of Leopold Metzenberg, whose family were Prussian Jews from the Poznan area of what is now Poland. They emigrated via Dublin and Glasgow to Chicago in the 1870s and Leopold eventually became a vice-president of the well-known mail-order firm of Sears, Roebuck & Co. He travelled widely in Europe collecting mainly watches and a few clocks and when he retired in 1930 he had acquired 570 watches. After his death in 1952 some watches and

Figure 16. The later hour wheel and friction spring for the hand.

this clock were donated to the Chicago Museum of Science & Industry, but kept in store until sold in 2010.

The front right-hand pillar of the clock is naïvely engraved (probably using a sharp-pointed chisel and a hammer) with ‘I, Prowent’, **figure 17**, but this is not the name of any recorded clockmaker and has not been found as a surname anywhere in Europe. However, there is a manor or farm of this name south of Poznan and it is an old Polish word that means income from a farm or mill or even the manor itself. This clock was a misfit in Leopold Metzenberg’s collection, most of which were highly decorative good-quality watches, and it was postulated that he had acquired it in Poland as a reminder of his heritage. Despite numerous enquires no examples of iron domestic clocks made in Poland could be found for comparison and I have since come to the conclusion that this clock’s origins lie elsewhere.

The construction has little resemblance to clocks made in Germany and the areas further east or south. Without detailing all the differences, its most likely origin is now thought to be France. But what of the name Prowent? The form of the engraved letters is consistent with the late sixteenth century, though W was not used in the French language until the twentieth century, apart from proper names of Germanic origin after about 1800. But there are rare instances on plaques, tombs, *etc*, where UV is written as W, and always in capital letters. This is likely to be the case here and the name is probably Prouvent or a variant such as Provent. The location may be north-east France, such as the clockmaking areas of Alsace or the Jura. Like many of these horological mysteries we will have to wait until other similar examples come to light or another clock is discovered signed by the enigmatic ‘I Prowent’.

The clock’s age is equally difficult to determine, but there are clues that indicate that it might be earlier than the first English lantern clocks, which were made in London some time between 1604 and 1615 or perhaps a little earlier. Analysis of the paint could only show that the dial had been painted before 1650, but not how long before. Two-wheel trains were used on very early clocks before it was found preferable to add an extra wheel to each train.

Early French clocks used nag’s head striking, but the French were among the first to adopt warned striking, which was first described by Leonardo de Vinci in about 1495. It is likely that few French clocks still used the nag’s head after about 1600. The use of only two wheels in each of the trains and the general construction indicate an early date. Using the hammer pins to provide overlift is also an early method, until superseded by more positive arrangements. While none of these features provide a firm date, a reasonable estimate is that this clock is likely to have been made at the end of the sixteenth century, perhaps as early as 1580.

Next month an iron posted-frame clock made about a century later, also with a painted dial, will be discussed. Its Gothic bell was defaced to save its owner from prison or the guillotine during the French Revolution.

Acknowledgement

I would like to thank Howard Bradley for his useful comments on possible origins of the name Prowent.